

Notes on *Alcis pammicra* (Prout), *A. maculata* (Moore) (Geometridae, Ennominae) and their allies from Southeast Asia, with descriptions of three new species

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Abstract Two species-groups of *Alcis* from Southeast Asia are revised. The *A. pammicra*-complex: *A. pammicra* (Prout), *A. eupithecioides* (West), *A. polysticta* (Hampson), comb. nov., *A. aagostigma* (Prout) and *A. manfredi* sp. nov. (Sumatra, Java). The *A. maculata*-complex: *A. maculata* (Moore), *A. micromaculata* sp. nov. (Sumatra), *A. herbuloti* Orhant, *A. bornemaculata* sp. nov. (Borneo), *A. nigrifasciata* (Warren) and *A. nigrolineata* (Wileman & South). The last species is tentatively placed in *Alcis*, because the male genitalia are atypical for *Alcis*.

Key words Geometridae, Ennominae, *Alcis*, taxonomic notes, new species, Southeast Asia.

Alcis Curtis is a large genus including many species distributed in the Palearctic and Oriental regions. Many *Alcis* species have been described from Southeast Asia alone, but some do not properly belong to *Alcis*, while some other species should be transferred to *Alcis* from various other genera. In this paper, as a part of my revisional study on *Alcis* from Southeast Asia, taxonomic notes on the following two species-groups are given with descriptions of three new species: *A. pammicra* and *A. maculata*, and their allied species, here named the “*pammicra*-complex” and the “*maculata*-complex” without strict definition for the sake of convenience.

The following acronyms are used to indicate the location of the specimens. BMH: Bishop Museum, Honolulu. BMNH: The Natural History Museum, London, UK. MS: Manfred Sommerer collection, Munich, Germany. NIAES: Natural Resources Inventory Center, National Institute for Agro-Environmental Sciences, Tsukuba, Japan. NSMT: National Science Museum, Tokyo, Japan. ZFMK: Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany. ZSM: Zoologische Staatssammlung, Munich, Germany.

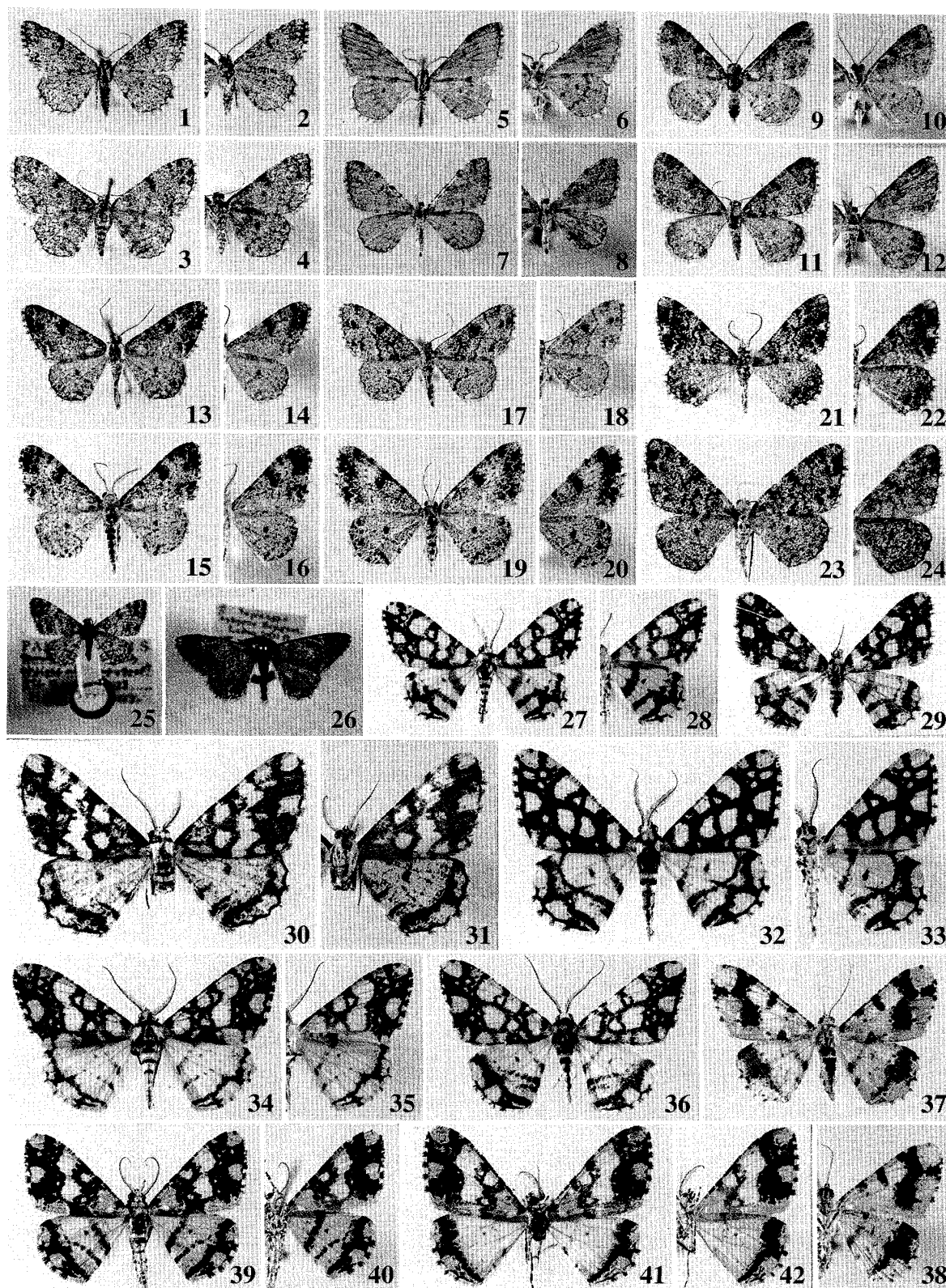
Unless stated otherwise, all the specimens including the type material recorded in this paper will be deposited in NIAES.

Alcis pammicra-complex

Alcis pammicra (Prout), a small sized species, was described as a member of *Cleora* Curtis, based on one male taken in the Cameron Highlands in Peninsular Malaysia. Holloway (1994) transferred *pammicra* to *Alcis* and included P. Malaysia, Sumatra and Borneo in the geographical range. My own research showed that some *pammicra*-like species were distributed in Southeast Asia. To confirm their identification, I examined the type specimens and their genitalia in BMNH, partly through Sir Anthony Galsworthy's kind help. In the following lines, *pammicra* and its allied species are redescribed with some notes and one species is described as new to science from Sumatra and Java.

Alcis pammicra (Prout) (Figs 1–4)

Cleora pammicra Prout, 1925: 57.



Figs 1-42. *Alcis* spp. 1-4. *A. pammicra* (Prout). 1-2. ♂, Sumatra. 3-4. ♀, Sumatra. 5-8. *A. manfredi* sp. nov. 5-6. Holotype. ♂, Sumatra. 7-8. Paratype. ♀, Java. 9-12. *A. aagostigma* (Prout). 9-10. ♂, Thailand. 11-12. ♀, Thailand. 13-20. *A. eupithecioides* (West). 13-14. ♂, Sumatra. 15-16. ♂, Mindanao. 17-18. ♀, Thailand. 19-20. ♀, Mindanao. 21-24. *A. polysticta* (Hampson). 21-22. ♂, Sri Lanka. 23-24. ♀, Sri Lanka. 25. Holotype of *Cleora*

Alcis pammicra: Holloway, 1994: 239; Parsons *et al.*, 1999: 31.

Length of forewing 10–12 mm, wingspan 19–21 mm. Both wings white without yellowish tint, irrorated with blackish brown, especially in basal and distal areas on forewing. Lines ill-defined. In male, large fovea developed on forewing, a cluster of spines on the third abdominal sternite and hind tibial hair-pencil developed.

Male genitalia (Fig. 43). Uncus tapering to blunt apex. Paired processes of juxta broad and short. Ampulla short, digitate, curved ventrad. Aedeagus with a row of spines on vesica. Also shown by Holloway (1994, fig. 506).

Female genitalia (Fig. 55). Colliculum shorter than broad, with parallel sides.

Type material examined. Holotype (Fig. 25). ♂, "Type/*Cleora pammicra* Prout, ♂, type/PAHANG F. M. S., Cameron's Highlands, at light, no 4 camp, 4,800 ft., Oct. 12nd [sic.] 1923, H. M. Pendlebury/91/Brit. Mus. 1925-59/Geometridae genitalia slide No. 21635", BMNH. Genitalia checked.

Material examined. Sumatra. Simalungun, Holzweg III 1,150 m, 14 km NE Prapat, 1 ♂, 12. iii. 1982, 1 ♀, 3. iv. 1984, 1 ♀, 20. ii. 1985, Holzweg II 1,050 m, 1 ♀, 3. vi. 1986; Sitahoan 1,450 m, 1 ♂, 10. ix. 1981, 1 ♂, 22. xi. 1981, 2 ♂, 27. xi. 1981, 1 ♂, 2–3. i. 1982, Toba-See, Tele 1,600 m, 1 ♂, 6. ix. 1975, Dairi Mts, 1 ♀, 27. iv. 1986, Dolok Merangir 180 m, 2 ♂, iv. 1974, Nias-ins., Lawalo, 1 ♂, 22–26. ix. 1979 (E. W. Diehl), MS. Aceh, Singha, Mata 1,720 m, 2 ♂, 25–26. i. 1989 (Plössl & Tarmann), MS. Dairi Mts 1,600 m, 1 ♂, 28. viii. 1979 (Diehl & Schintlmeister), Liwa 1,000 m, 1 ♂, 11. x. 1981 (A. Schintlmeister), Berastagi 1,500 m, 1 ♀, 26–28. vii. 1985 (R. Sato).

Geographical range. P. Malaysia, Borneo, Sumatra.

I (Sato, 1996) recorded *pammicra* from Thailand on one male specimen taken at Doi Suthep, Chiang Mai, in the ZFMK collection, but it was a misidentification of the next species, *eupithecioides*. Thailand should be deleted from the geographical range of *pammicra* for the moment.

Alcis eupithecioides (West) (Figs 13–20)

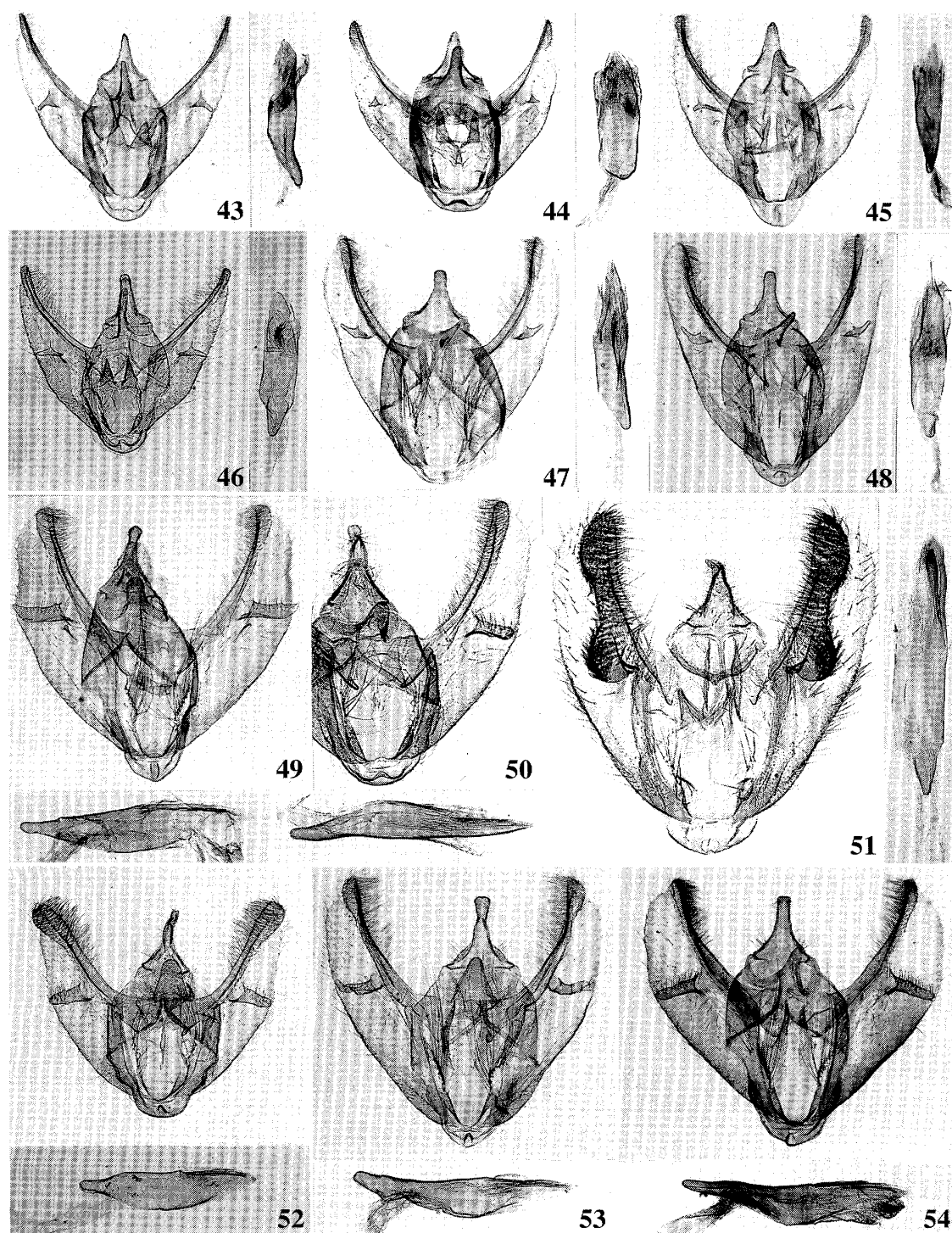
Boarmia eupithecioides West, 1929: 121.

Alcis eupithecioides: Parsons *et al.*, 1999: 29.

Length of forewing 11–13 mm, wingspan 20–21 mm. Similar to *pammicra*, but different from it as follows. Variable in size, but generally a little larger; both wings having yellowish tint, more strongly irrorated with blackish brown in basal and distal areas. In the holotype (male, fig. 26), both wings "cartridge-buff, densely irrorated with fuscous" (West, 1929), giving much darker appearance than the other specimens examined. In male, fovea on forewing, a cluster of spines on the third abdominal sternite and hind tibial hair-pencil as well developed as in *pammicra*.

Male genitalia (Figs 47–48). Different from those of *pammicra*. Uncus almost parallel-

pammicra Prout. ♀, P. Malaysia. 26. Holotype of *Boarmia eupithecioides* West. ♂, Luzon. 27–29. *A. micromaculata* sp. nov. 27–28. Holotype. ♂, Sumatra. 29. Paratype. ♀, Sumatra. 30–31. *A. nigrolineata* (Wileman & South). ♂, Luzon. 32–36. *A. maculata* (Moore). 32–33. ♂, Thailand. 34–35. ♂, Sumatra. 36. ♂, Borneo. 37–38. *A. nigrifasciata* (Warren). ♂, Sulawesi. 39–40. *A. herbuloti* Orhant. ♂, P. Malaysia. 41–42. *A. bornemaculata* sp. nov. Holotype. ♂, Borneo.



Figs 43–54. Male genitalia of *Alcis* spp. 43. *A. pammicra* (Prout). Sumatra. RS-6547. 44. *A. manfredi* sp. nov. Holotype. Sumatra. RS-6587. 45. *A. polysticta* (Hampson). Sri Lanka. RS-5831. 46. *A. aagostigma* (Prout). Thailand. RS-3373. 47–48. *A. eupithecioides* (West). 47. Mindanao. RS-6543. 48. Borneo. RS-6549. 49. *A. maculata* (Moore). Sumatra. RS-5128. 50. *A. nigrifasciata* (Warren). Sulawesi. RS-4105. 51. *A. nigrolineata* (Wileman & South). Luzon. RS-2739. 52. *A. micromaculata* sp. nov. Paratype. Sumatra. RS-4107. 53. *A. bornemaculata* sp. nov. Holotype. RS-5829. 54. *A. herbuloti* Orhant. P. Malaysia. RS-6589.

sided; pair of processes of juxta longer and slenderer; digitate ampulla curved dorsad; spines on aedeagus vesica less developed.

Female genitalia (Figs 57–58). Colliculum parallel-sided, almost equidistant from length to width.

Type material examined. Holotype (Fig. 26). ♂, Philippines, Luzon, Benguet, Sapiangao 5,800 ft., 15. xii. 1912, Geometridae genitalia slide No. 21636. BMNH, Genitalia checked.

Material examined. Thailand. Chiangmai, Doi Suthep 1,325 m, Meo Village View Point, 1 ♂, 22. xi–4. xii. 1989 (Schnitzler) (Sato, 1996: 223, as *pammicra*), 1 ♀, same data as male (Schnitzler), ZFMK. P. Malaysia. Cameron Highlands 1,500 m, 1 ♂ 1 ♀, 10–11. iv. 1986 (K. Yazaki), Fraser's Hill, 3 ♂, 29. iv–5. v. 1993 (T. Tanabe). Borneo. Sabah, Ranau, Kundasang, 1 ♂, 5. i. 2000 (A. Sasaki). Sumatra. Aceh, Singha, Mata 1,720 m, 3 ♂, 25–26. i. 1989 (Plössl & Tarmann), Toba-See, Tele 1,600 m, 1 ♀, 3. vi. 1983 (E. W. Diehl), MS. Sitahoan 1,450 m, 1 ♂, 18. v. 1991 (E. W. Diehl), S. Padang, 2 ♂, 18. x. 1981 (A. Schintlmeister), Berastagi, 2 ♂, 27. iv–4. v. 1988 (S. & A. Saito). Sulawesi. Puncak 1,000–1,200 m, 1 ♂ 2 ♀, 10–19. v. 1984 (A. Schintlmeister), Bonthain, Perang Bintlo, Mt Lompobatang, 1 ♂ 2 ♀, 3–4. v. 1993 (S. & A. Saito), Nr Tondano, Mt Makaweiben 1,000 m, 1 ♀, vii. 1988. Philippines. Luzon Is. Mountain Prov., Barlig 1,550 m, 1 ♀, 17, 19. vii. 1985, Sagada 1,550 m, 1 ♀, 21–23. vii. 1985 (M. Owada), NSMT. Abatan, Buguias 1,800–2,000 m, 1 ♂, 2. vi. 1964 (H. M. Torrevillas), Liwo 1,000–1,300 m, 1 ♂, 9–10. vi. 1967, BMH. Banaway, 1 ♂, 28. i. 1986. Mindanao Is. Davao, Mt Talomo 1,100 m, 1 ♂, 3–6. viii. 1985 (M. Owada), Baracatan, Davao City, 1 ♀, 27–29. vi. 1977 (Y. Kurosawa), NSMT. Mt Binansilang 1,200 m, 1 ♂, 2. x. 1988 (Cerny & Schintlmeister), Mt Dolang-dolang 1,500–1,700 m, 1 ♂, 9–17. viii. 1999, 1 ♂, 2–7. xi. 1999, 2 ♀, 4–9. ii. 2000, Mt Kalatungan 1,800 m, 1 ♂, 29. vii–2. viii. 2000, Mt Matutum 1,420 m, 1 ♀, 25–28. xii. 2000, Mt Kitanglad 1,400 m, 6 ♂ 4 ♀, 16–25. x. 2003 (native collector).

Geographical range. Philippines (Luzon, Mindanao), Thailand, P. Malaysia, Borneo, Sumatra, Sulawesi. These are the first records from places other than Luzon.

***Alcis polysticta* (Hampson), *comb. nov.* (Figs 21–24)**

Boarmia polysticta Hampson, 1902: 507.

Hypomecis polysticta: Parsons *et al.*, 1999: 475.

Length of forewing 11–14 mm, wingspan 18–21 mm. More similar to *eupithecioides* than to *pammicra* in size, colour and maculation. Easily distinguished from them by lack of a cluster of spines on the third abdominal sternite and hind tibial hair-pencil, and by the smaller fovea in the male.

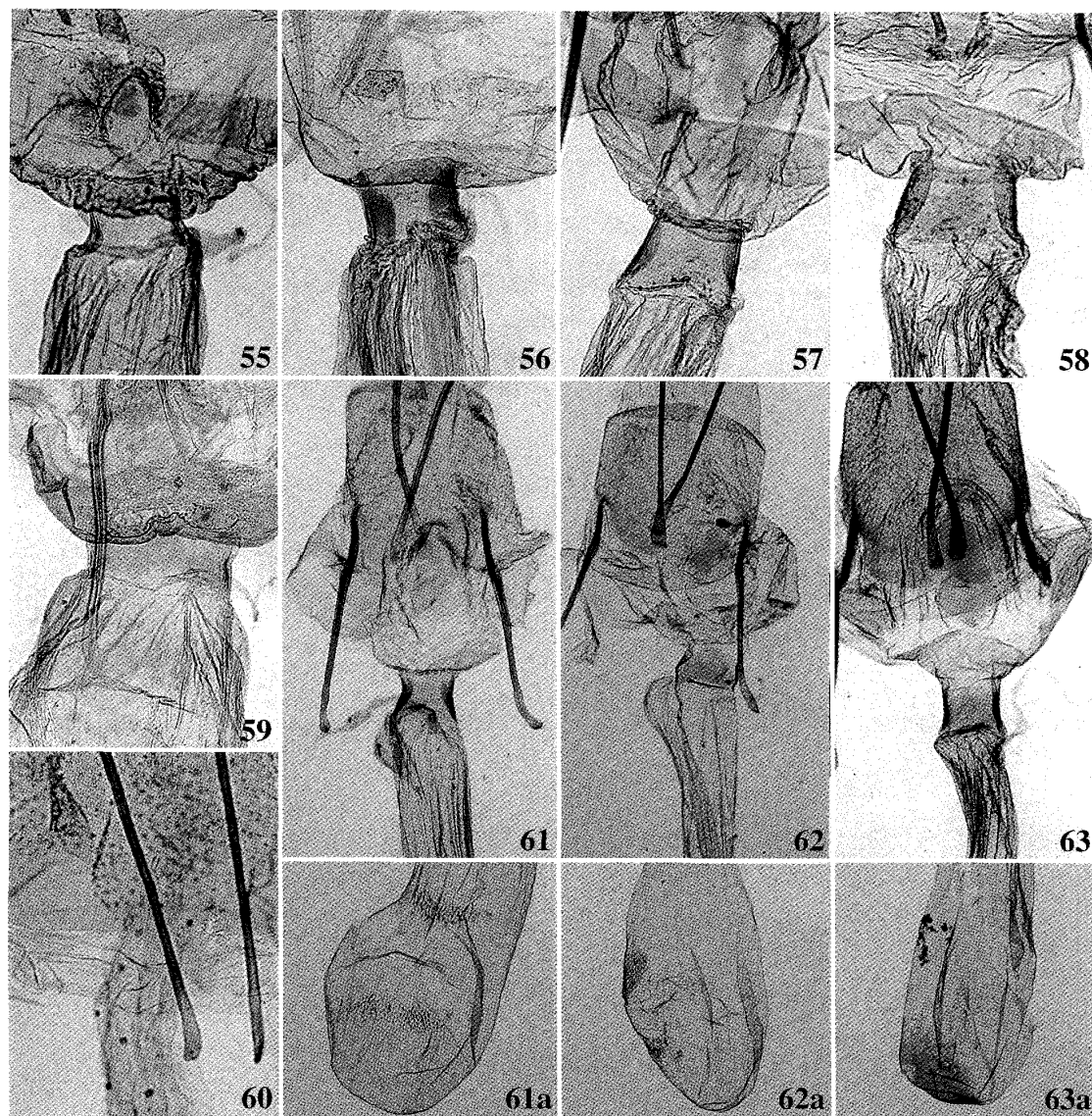
Male genitalia (Fig. 45). Uncus broad, tapering to a blunt apex; pair of processes of juxta slender; digitate ampulla with wide base, curved ventrally; aedeagus without spines on vesica.

Female genitalia (Fig. 60). Colliculum apparently not developed.

Type material examined. Holotype. ♂, Ceylon, Maturata, Geometridae genitalia slide No. 16196, BMNH. Genitalia checked.

Material examined. Sri Lanka. World's End, S-side 6°48'N 80°51'E, primary rainforest 1,950 m, 5 ♂ 1 ♀, 1–2. iv. 1997 (Schintlmeister & Sinjaev).

Geographical range. Sri Lanka.



Figs 55–63. Female genitalia of *Alcis* spp. 55. *A. pammicra* (Prout). Sumatra. RS-5148. 56. *A. manfredi* sp. nov. Paratype. Java. RS-5151. 57–58. *A. eupithecioides* (West). 57. Sumatra. RS-6562. 58. Mindanao. RS-6551. 59. *A. aagostigma* (Prout). Thailand. RS-6581. 60. *A. polysticta* (Hampson). Sri Lanka. RS-6563. 61. *A. maculata* (Moore). Sumatra. RS-6575. 62. *A. micromaculata* sp. nov. Paratype. Sumatra. RS-6574. 63. *A. nigrifasciata* (Warren). Sulawesi. RS-6576. a: anterior part of bursa copulatrix.

Alcis aagostigma (Prout) (Figs 9–12)

Cleora aagostigma Prout, 1927: 939.

Alcis aagostigma: Sato, 1991: 285; Parsons *et al.*, 1999: 27.

Length of forewing 11–17 mm, wingspan 17–18 mm. Posterior end of thorax prominently black. Both wings variable in colour, but more or less tinged with brown, especially basad of antemedial line and distad of postmedial line. In male, a cluster of spines absent on the third abdominal sternite and hind tibia without hair-pencil.

Male genitalia (Fig. 46). Pair of processes of juxta as broad and short as in *pammicra*, but digitate ampulla longer and slenderer than in *pammicra*.

Female genitalia (Fig. 59). Colliculum shortest among the congeners, weakly sclerotized laterally.

Type material examined. Holotype. ♂, "Upper Burma: Hpimaw Fort, Nr. Myitkvina 8,000 ft., 9–13. viii. 1923, Capt. A. E. Swann/*Cleora aagostigma* Prout, ♂, type/Type/L. B. Prout Coll. B. M. 1939-643, Brit. Mus. 1923-488/Geometridae genitalia slide No. 5172", BMNH. Genitalia checked.

I recorded this species from Thailand as *Alcis* with the illustration of a female specimen (Sato, 1991: 282, fig. 16). Here it is newly recorded from Vietnam.

Additional material examined. N. Vietnam. Lao Cai Prov., Sa Pa 1,500 m, 1 ♂, 25–28. v. 1997 (B. Tanaka).

Geographical range. Burma, Vietnam (new record), Thailand.

Alcis manfredi sp. nov. (Figs 5–8)

Length of forewing 9–11 mm, wingspan 16–17 mm. Similar to *pammicra* in small-sized whitish wings, but easily distinguished from it by the following characters. Both wings almost uniformly pale grey with less defined maculation. Forewing: antemedial line almost straight, slanting outward to inner margin; postmedial line gently excurved beyond cell; discocellular marking faintly reproduced as a streak. Hindwing: postmedial line visible at posterior half; discocellular marking more developed than on forewing. In male, a cluster of spines absent on the third abdominal sternite, hind tibia without hair-pencil.

Male genitalia (Fig. 44). Most similar to those of *polysticta* in uncus and juxta, but pair of processes of juxta stouter, digitate ampulla smaller, triangular, not curved, aedeagus broader with a row of spines on vesica.

Female genitalia (Fig. 56). Colliculum more widely sclerotized, parallel-sided, a little shorter than width.

Holotype. ♂, N. Sumatra, Dolok Merangir 180 m, iv. 1974 (E.W. Diehl), ZSM after further study, at present in MS. Paratypes. Java, G. Muria, 1 ♀, 9. x. 1996, 1 ♂, 13. x. 1996, 1 ♂, 14. x. 1996, 1 ♀, 14. xi. 1996, Mt Merapi, 2 ♀, vi. 1996 (native collector).

Geographical range. Sumatra, Java.

Etymology. The specific name is dedicated to Mr Manfred Sommerer, who enabled me to examine the holotype of this species.

Alcis maculata-complex

Alcis maculata (Moore) and its allies had long been treated as belonging to the genus *Arichanna* Moore before being transferred to *Alcis* by Inoue (1987). The male antenna, venation of forewing and genitalia of both sexes clearly show them to be typical members of *Alcis*, as pointed out by Inoue (1987). However, *A. nigrolineata* (Wileman & South) is different from the other congeners in the male genitalia, as mentioned below. In this paper two new species are described from Borneo and Sumatra with some taxonomic notes on the known species. The species of this complex can be easily distinguished from each other by the maculation, though, apart from *nigrolineata*, they have a very homogenous genital structure.

***Alcis maculata* (Moore) (Figs 32–36)**

- Arichanna maculata* Moore, 1868: 658.
Alcis maculata: Inoue, 1987: 264; Parsons *et al.*, 1999: 30.
Arichanna plagiogramma Hampson, 1902: 509.
Arichanna maculata negans Prout, 1932: 109.
Alcis maculata negans: Inoue, 1987: 264.
Arichanna (Dictyodea) prodictyota Wehrli, 1933: 509.
Alcis maculata prodictyota: Inoue, 1987: 264.
Icterodes taiwanica Bastelberger, 1909: 33.
Alcis maculata taiwana (misspelling): Inoue, 1987: 264.

The reticulate wing maculation makes this species easily distinguished from the other congeners, though there is some variation in size, colour and markings, geographically, seasonally and individually. After *maculata* was described from India, the following three subspecies were segregated: *negans* (Prout) from Borneo, *prodictyota* (Wehrli) from China and *taiwanica* (Bastelberger) from Taiwan. The last two were originally described as distinct species. Further study will be needed to clarify the status of the subspecies with consideration for individual variation. In my previous papers, specimens from Thailand (Sato, 1991) and Nepal (Sato, 1993) were recorded as ssp. *prodictyota*, but both should have been treated as the nominotypical subspecies. The treatment of the Nepalese population has already been corrected by me (Sato, 1994).

Male and female genitalia are shown in Figs 49 and 61.

Type material examined. Syntype of *Arichanna maculata* Moore, ♀, Bengal [India], BMNH. Syntype of *Arichanna plagiogramma* Hampson, ♀, Tibet, Yatong (Hobson), BMNH. Holotype of *Arichanna maculata negans* Prout, ♂, Borneo, Sabah, Mt Kinabalu Lumu Lumu, 5,500 feet, 7–16. iv. 1929, BMNH. Holotype of *Arichanna maculata prodictyota* Wehrli, ♂, “Chasseurs indigènes, de Tà-tsien-lou, Récolte de 1910/A. *prodictyota* Wehrli, Typ/ex coll. Wehrli, 17/35/Genitalpräp. ZFMK Nr. 785”, ZFMK. Genitalia checked.

Material examined. Many specimens collected from Nepal, Thailand, Taiwan, Borneo and Sumatra.

Geographical range. India, Nepal, Tibet, Thailand, China (*prodictyota*), Taiwan (*taiwanica*), Borneo (*negans*), Sumatra.

***Alcis micromaculata* sp. nov. (Figs 27–29)**

Length of forewing 13–14 mm, wingspan 23–26 mm. Similar to *maculata* in reticulate wing maculation, but can be distinguished from it as follows. Smaller in size; in *maculata* (Sumatran specimens), length of forewing 15–17 mm and wingspan 24–32 mm. Both wings more strongly tinged with yellow; black maculation more developed, especially on hindwing, where medial and postmedial lines broader, forming black bands; discocellular spot closer to or touching medial band.

Male genitalia (Fig. 52). Similar to those of *maculata*, but cucullus broader, paired processes of juxta shorter and broader; digitate ampulla stouter.

Female genitalia (Fig. 62). Similar to those of *maculata*, but the eighth abdominal tergum shorter; lamella antevaginalis broader posteriorly; colliculum more weakly sclerotized laterally.

Holotype. ♂, N. Sumatra, Holzweg III 1,200 m, 18 km to Prapat, 30–31. vii. 1985 (R.

Sato). Paratypes. Sumatra, Ketambe, 2 ♂, 16. vi. 1972 (Roesler & Küppers), ZFMK. N. Sumatra, Strasse Siantar-Prapat 14 km vor p., 1,150 m, 1 ♂, 25. xii. 1975 (R. Bender & E. W. Diehl), Sumatra sept. Simalungun, Holzweg III 1,150 m, 14 km NE Prapat, 98°58' E 2°46' N, 2 ♂, 23. xii. 1975, 1 ♂, 28. xii. 1975, 4 ♂, 25. xii. 1975 (Bender & Diehl), 1 ♂, 15. vi. 1982, 1 ♂, 17. vii. 1982, 1 ♂, 28–30. xi. 1982, 1 ♂, 14. x. 1983 (E. W. Diehl), Sumatra occ., ca 30 km östl., Tapan 1,000 m, 24. ii. 1976 (M. Sommerer), Talun Sunkit, 2 ♂, 22–26. vii. 1982, Batu Island, Tanah Masa, 1 ♂, v. 1983, Dairi Mts, 15 km W Sidikalang 850 m, 2 ♂, 8. iii. 1981 (E. W. Diehl), Holzweg II 1,050 m, 1 ♂, 24–27. viii. 1995 (M. Sommerer), MS. Berastagi 1,000 m, 1 ♂, 4. vi. 1973 (E. W. Diehl), N. Sumatra, 10 km S Prapat, Ainoli Forest 1,400 m, 2 ♂, 14. vii. 1979 (Turlin), ZSM. N. Sumatra, Holzweg II 1,050 m, near Prapat, 1 ♂, 18. vi. 1986 (E. W. Diehl), Sumatera Utara, Aek Nauli 1,200 m, 1 ♀, 19–21. iii. 1994 (K. Matsumoto & K. Konishi).

Geographical range. Sumatra.

Etymology. This species resembles *maculata* in facies but is much smaller.

Alcis herbuloti Orhant (Figs 39–40)

Alcis herbuloti Orhant, 2000: 4.

Male. Length of forewing 13–15 mm, wingspan 22–26 mm. Similar to *maculata*. Forewing: pale yellow, suffused with reddish brown except medial area; lines partly fused and short streaks joining lines absent. Hindwing: pale yellow, lightly suffused with reddish brown distally; black maculation less developed. Female unknown to me.

Male genitalia (Fig. 54). Similar to those of *maculata*. Cucullus a little narrower; digitate ampulla variable in shape, but tending to be slenderer, arising a bit farther from costa. Also shown by Orhant (2000, fig. 22).

Female genitalia. Shown by Orhant (2000: 7, fig. 26). The original description: “close to *maculata*, but distal ends of apophyses posteriores and anteriores not spatulate. Antrum and ductus bursae narrower” (originally in French, translated by Mr Sommerer). Not examined by me.

Material examined. P. Malaysia, Cameron Highlands, Gunung Brinchang, 1 ♂, 18. iv. 1990, 2 ♂, 21. iv. 1990, *ditto*, Ringlet, 1 ♂, 19. iv. 1990, *ditto*, Tanah Ratah, 1 ♂, 20. iv. 1990 (N. Bito), Gunung Brinchang 2,000 m, 1 ♂, 10. iv. 1999 (K. Nakao), Cameron Highlands, 1 ♂, x–xii. 1985 (*ex* K. C. Liew), Fraser’s Hill, 1 ♂, 22–24. iv. 1990 (N. Bito).

This species was described from S. Vietnam (holotype and two paratypes) and P. Malaysia (one paratype) by Orhant (2000). It can be distinguished more effectively by external appearance than by the genitalia.

Geographical range. S. Vietnam, P. Malaysia.

Alcis bornemaculata sp. nov. (Figs 41–42)

Male. Length of forewing 14–15 mm, wingspan 24–25 mm. Similar to *herbuloti*, but distinguished from it as follows. Forewing: paler in colour, less reticulate, especially in medial region. Hindwing: medial line almost vanished; postmedial line absent. Female unknown.

Male genitalia (Fig. 53). Similar to those of *herbuloti*, but cucullus broader, digitate ampulla closer to costa, indented irregularly as a whole. The shape of ampulla is quite peculiar, being well separable from those of the other congeners.

Holotype. ♂, Borneo, Sabah, Mt Kinabalu, Park H. Q. 1,560 m, 2 ♂, 8–18. xi. 1979 (T. Hasegawa). Paratypes. Kinabalu, Crocker Range 500–1,500 m, 1 ♂, vi. 1992 (native collector), Sabah, Poring, 1 ♂, 18. ii. 1980 (H. Arimoto).

Geographical range. Borneo.

Etymology. The specific name, *bornemaculata*, means that the species is distributed in Borneo and similar to *maculata*.

***Alcis nigrifasciata* (Warren) (Figs 37–38)**

Parasynergia nigrifasciata Warren, 1896: 393.

Medasina nigrifasciata circumplexa Prout, 1935: 230.

Alcis nigrifasciata: Inoue, 1987: 264; Parsons *et al.*, 1999: 30.

Length of forewing 14–18 mm, wingspan 27–29 mm. This species is distinct from its allied species by wing maculation (less reticulate) and male antenna (paler in colour).

Male genitalia (Fig. 50). Similar to those of *maculata*, but paired processes of juxta broader; digitate ampulla straighter; aedeagus slenderer.

Female genitalia (Fig. 63). Similar to those of *maculata*, but lamella antevaginalis more strongly sclerotized laterally; bursa copulatrix lightly sclerotized near anterior extremity, without minutely spined bands.

Type material examined. Holotype of *Parasynergia nigrifasciata* Warren, ♂, South Java 1,500 feet, H. Fruhstorfer, BMNH. Holotype of *Medasina nigrifasciata circumplexa* Prout, ♂, East Java, Tengger 5,000 feet, Singolangoe, May 1934, J. P. A. Kalis, BMNH.

Material examined. Sumatra. Holzweg III 1,150 m, 14 km NE Prapat, 1 ♂, 31. xii. 1984, 1 ♂, 1–16. iv. 1985 (E. W. Diehl), MS. Sulawesi. Puncak Dingin 1,700 m, 2 ♂, ix–x. 1985 (S. Nagai), Sampuraga, 4 ♂, vi. 1995 (native collector), Sampuraga 1,300 m, 1 ♂ 1 ♀, 1. i. 1995 (S. & A. Saito). W. Java, Mt Gede, Cibeureum Water fall 1,700 m, 1 ♂, 11. ix. 1996 (T. Masui).

Geographical range. Borneo, Sumatra, Java, Sulawesi (new record).

Nigrifasciata was described from S. Java (meaning “the southern part of West Java” according to Prout, 1935: 230) by Warren (1896), and *circumplexa* was founded as a subspecies of East Java by Prout (1935). The characteristics of *circumplexa* pointed out by Prout (1935), *i. e.* forewing black spots more enlarged, and hindwing submarginal line obsolete, are not geographical but individual. *Circumplexa*-like specimens are mixed also in Sulawesian material.

***Alcis nigrolineata* (Wileman & South) (Figs 30–31)**

Arichanna nigrolineata Wileman & South, 1917: 101.

Alcis nigrolineata: Inoue, 1987: 264; Parsons *et al.*, 1999: 30.

Length of forewing 18 mm, wingspan 31 mm (one male). This species has reticulate maculation like *maculata* and its allies, but is quite different from them in the male genitalia.

Male genitalia (Fig. 51). Medial part of gnathos much smaller; valva cucullus broader with large spined roundish process at its proximal end, instead of digitate ampulla; juxta less deeply divided, making a pair of sclerotized short processes; stick-like cornutus on aedeagus vesica.

The female genitalia have not been examined yet. The male genitalia are atypical for *Alcis* and indicate possible relationships to the genus *Arichanna* Moore. *Arichanna* is a large genus containing more than 70 species (Parsons *et al.*, 1999). Wehrli (1933) divided *Arichanna* into six subgenera by the male antenna and male genitalia mainly based on the Chinese species. However, more comprehensive study is necessary to confirm the generic or subgeneric treatment of the species placed in *Arichanna*, as suggested by Sommerer & Stüning (1997). Actually, this species is similar to *A. (Ictreodes) fraterna* (Butler) (type species of *Ictreodes*) in the presence of a spined process at the proximal end of the cucullus, but is different from it in the other characteristics. Since knowledge of *Arichanna* is currently too limited, I tentatively retain *nigrolineata* in *Alcis* at present.

Type material examined. Syntype of *Arichanna nigrolineata* Wileman & South, ♂, Philippines, Luzon, Pauai, sub-province of Benguet, Hights' Place 7,000 ft., 2 & 3. xii. 1912, BMNH.

Material examined. Philippines, N. Luzon, Mountain Prov., Mt Data 2,250 m, 1 ♂, 24–26. vii. 1985 (M. Owada), NSMT.

Geographical range. Philippines (Luzon).

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References

- Bastelberger, W., 1909. Neue Geometriden aus Central-Formosa. *Ent. Z., Frankf. a. M.* **23** (7): 33–34.
 Hampson, G. F., 1902. The moth of India. Supplementary paper to the volumes in "The Fauna of British India". Part 7. *J. Bombay nat. Hist. Soc.* **14**: 494–519.
 Holloway, J. D., 1994 (not "1993"). The moths of Borneo: family Geometridae, subfamily Ennominae. [=The Moths of Borneo, Part 11]. *Malay. Nat. J.* **47**: 1–309, pls 1–19, 593 figs.
 Inoue, H., 1987. Geometridae of Eastern Nepal based on the collection of the Lepidopterological research expedition to Nepal Himalaya by the Lepidopterological Society of Japan in 1963, Part III. *Bull. Fac. Domest. Sci. Otsuma Wom. Univ.* **23**: 215–270.
 Moore, F., 1868. On the lepidopterous insects of Bengal. *Proc. zool. Soc. Lond.* **1867**: 612–665.
 Orhant, G. E. R. J., 2000. Nouveaux Geometridae Est-Asiatiques (Lepidoptera Geometridae. Geometrinae & Ennominae). *Bull. Soc. ent. Mulhouse* **2000**: 1–9.
 Parsons, M. S., Scoble, M. J., Honey, M. R. & L. M. Pitkin, 1999. In Scoble, M. J. (Ed.), *Geometrid Moths of the World: a Catalogue* (Lepidoptera, Geometridae). 1016 pp., Index 129 pp. CSIRO Publishing, Collingwood/Apollo Books/Stenstrup.
 Prout, L. B., 1925. Geometrid descriptions and notes. *Novit. zool.* **32**: 31–69.
 ———, 1927. On a collection of moths of the family Geometridae from Upper Burma made by Captain A. E. Swann. Part IV. *J. Bombay nat. Hist. Soc.* **31**: 932–950.

- , 1932. On the Geometridae of Mount Kinabalu. *J. fed. Malay. St. Mus.* **17**: 39–111.
- , 1935. New Geometridae from East Java. *Novit. zool.* **34**: 221–238.
- Sommerer, M. & D. Stüning, 1997. Spolia Sumatrensis: A new species of *Arichanna* Moore 1868 and a new subspecies of *Bracca exul* Herrich-Schäffer [1856] (Lep., Geometridae, Ennominae). *Heteroc. sumatr.* **12**: 17–27.
- Sato, R., 1991. Records of the genera *Hypomecis*, *Cleora* and *Alcis* (Geometridae; Ennominae) from Thailand, with descriptions of three new species and one new subspecies. *Tyô Ga* **42**: 271–288.
- , 1993. Geometridae: Ennominae (part). In Haruta, T. (Ed.), Moths of Nepal, part 2. *Tinea* **13** (Suppl. 3): 5–30, pls 34–38.
- , 1994. Geometridae: Ennominae (part). In Haruta, T. (Ed.), Moths of Nepal, part 3. *Tinea* **14** (Suppl. 1): 41–62, pls 73–76.
- , 1996. Records of the Boarmiini (Geometridae; Ennominae) from Thailand III. *Trans. lepid. Soc. Japan* **47**: 223–236.
- Warren, W., 1896. New species of Drepanulidae, Thyrididae, Uraniidae, Epiplemidae, and Geometridae in the Tring Museum. *Novit. zool.* **3**: 335–419.
- Wehrli, E., 1933. Ueber neue paläarktische Geometrinae und ein neues Subgenus (Lepid. Heteroc.). *Int. ent. Z.* **27** (45): 509–513.
- West, R. J., 1929. Descriptions of new species of Japanese, Formosan, and Philippine Geometridae. *Novit. zool.* **35**: 105–131.
- Wileman, A. E., & R. South, 1917. New species of Geometridae from the Philippines. *Entomologist* **50**: 100–102.

摘 要

東南アジアの *Alcis pammicra*, *A. maculata* (シャクガ科, エダシャク亜科) とそれぞれの近縁種に関する知見と3新種の記載 (佐藤力夫)

Alcis 属は日本を含む旧北区から東洋区に分布する大属であり、東南アジアに限っても多くの種が知られている。しかし、他属に移すべき種の問題や、種レベルの分類の混乱もあり、今後広範な再検討が必要な属である。本報では、*A. pammicra* (Prout) と *A. maculata* (Moore) とそれぞれに近縁の種群について分類学的な再検討をおこなった。得られた主要な知見は次の通りである。

Alcis pammicra-complex

マレー半島からボルネオ、スマトラにかけて *pammicra* に外観の類似した種が分布しており、同定に混乱が見られたが、1種はフィリピン (ルソン) から記載された *eupithecioides* (West) であり、もう1種は新種であることがわかり *manfredi* Sato (スマトラ, ジャワ) と命名記載した。そのほか、*A. polysticta* (Hampson) (新結合)、*A. aagostigma* (Prout) (ベトナムから初記録) を取り上げた。

Alcis maculata-complex

黄色と黒の網目状の斑紋が特徴的な種群である。*A. maculata* (Moore) は、インドから記載された種であるが、その後 *negans* (ボルネオ)、*prodictyota* (中国)、*taiwanica* (台湾) の3亜種が分離されている。亜種の問題については、地理的変異に加え個体による変異の幅も大きいので、種への昇格の可能性も含め、今後さらに研究が必要である。また、ルソンから記載された *A. nigrolineata* (Wileman & South) は、♂交尾器の形態が *Alcis* 属としては異質で、むしろ *Arichanna* 属との関連を示唆しているように思える。しかし、*Arichanna* も大きな属で、いくつかの亜属への分割が試みられてはいるが、まだ安定したものではない。この種をすんなりと帰属させられる亜属はない。このような状況から、本報では暫定的にこれまで通り *Alcis* 属に置くことにした。なお、*maculata* に似るが明らかに小型で雌雄交尾器も異なる *micromaculata* Sato (スマトラ) と、*A. herbuloti* Orhant に近縁だが外観と雄交尾器が異なる *bornemaculata* Sato (ボルネオ) を新種として記載した。その他、*A. nigrifasciata* (Warren) (スラウェシから初記録) を取り上げた。

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